1. A drop hammer for driving a pile comprising:

a housing member defining a housing chamber; and

a ram member supported within the housing chamber for movement relative to the housing member between an upper position and a lower position; whereby

when the ram member moves into the lower position, the impact of the ram member drives the pile; and

when the ram member falls below a preload position between the lower and upper positions, fluid within a preload chamber portion of the housing chamber compresses as the ram member moves into the lower position.

2. A drop hammer as recited in claim 1, in which the housing member comprises a vent port for allowing fluid flow into and out of the housing chamber under predetermined conditions.

3. A drop hammer as recited in claim 2, in which the vent port allows ambient air to flow into the housing chamber.

4. A drop hammer as recited in claim 2, in which fluid is prevented from flowing through the vent port when the ram member is below the preload position.

5. A drop hammer as recited in claim 4, further comprising seal system for sealing the preload chamber portion of the housing chamber when the ram member is below the preload position.

6. A drop hammer as recited in claim 5, in which:

the ram member defines a ram side wall;

the housing member defines a housing interior wall;

the seal system comprises a ram seal for inhibiting fluid flow between the ram side wall and the housing interior wall.

7. A drop hammer as recited in claim 1, further comprising a helmet member supported by the housing member for movement relative to the housing member between a rest position and an impact position, where the impact of the ram member is transmitted to the pile through the helmet member.

8. A drop hammer as recited in claim 5, further comprising:

a helmet member supported by the housing member for movement relative to the housing member between a rest position and an impact position; wherein

the impact of the ram member is transmitted to the pile through the helmet member;

the helmet member extends through a helmet opening formed in the housing member; and

the seal system comprises a helmet seal for inhibiting fluid flow between the helmet member and the housing member through the helmet opening.

9. A drop hammer as recited in claim 8, in which:

the ram member defines a ram side wall;

the housing member defines a housing interior wall;

the seal system comprises a ram seal for inhibiting fluid flow between the ram side wall and the housing interior wall.

10. A drop hammer as recited in claim 1, further comprising a lifting system for moving the ram member from the lower position to the upper position.

11. A drop hammer as recited in claim 1, further comprising a clamp assembly for securing the drop hammer to the pile.

12. A drop hammer as recited in claim 7, further comprising a clamp assembly for securing the helmet member to the pile.

13. A method of driving a pile comprising:

providing a housing member defining a housing chamber; and

supporting a ram member within the housing chamber for movement relative to the housing member between an upper position and a lower position;

raising the ram member into the upper position;

allowing the ram member to fall from the upper position to the lower position such that the impact of the ram member drives the pile;

while the ram member is above a preload position, allowing fluid to flow out of a preload chamber portion of the housing chamber defined by the housing member; and

while the ram member is below the preload position, substantially preventing fluid from flowing out of the preload chamber portion of the housing chamber, where fluid within the preload chamber portion of the housing chamber compresses as the ram member moves from the preload position to the lower position.

14. A method as recited in claim 13, further comprising the step of allowing ambient air to flow into the housing chamber as the ram member is raised above the preload position.

15. A method as recited in claim 13, further comprising the step of sealing the preload chamber portion of the housing chamber when the ram member is below the preload position.

16. A method as recited in claim 13, further comprising the steps of:

supporting a helmet member for movement relative to the housing member between a rest position and an impact position; and

transmitting the impact of the ram member to the pile through the helmet member.

17. A method as recited in claim 16, further comprising the step of securing the helmet member to the pile.

18. A drop hammer for driving a pile comprising:

a housing member defining a housing chamber and a vent port;

a ram member supported within the housing chamber for movement relative to the housing member between an upper position and a lower position; and

a helmet member supported by the housing member for movement relative to the housing member between a rest position and an impact position; whereby

as the ram member falls from the upper position to a preload position between the lower and upper positions, fluid exits the housing chamber through the vent port;

when the ram member falls below the preload position, fluid within a preload chamber portion of the housing chamber compresses as the ram member moves into the lower position; and

when the ram member moves into the lower position, the impact of the ram member on the helmet member drives the pile.

19. A drop hammer as recited in claim 18, further comprising seal system for sealing the preload chamber portion of the housing chamber when the ram member is below the preload position.

20. A drop hammer as recited in claim 18, further comprising a lifting system for moving the ram member from the lower position to the upper position.

21. A drop hammer as recited in claim 18, further comprising a clamp assembly for securing the helmet member to the pile.